REMARKS

Applicants respectfully request entry of the above supplemental amendment to replace the submission of June 6, 2005.

Claim 32 is amended. Support for the amendment can be found in the claims as originally filed and in Claim 32 as presented on February 3, 2003. No new matter is introduced.

Claim 32 is rejected under 35 U.S.C. § 101 in the Office Action of February 4, 2005 for being directed to non-statutory subject matter in reciting "a cell comprising". The Office Action suggests that the "hand of man" is necessary to overcome the rejection.

It is respectfully submitted that claim 32 does require the hand of man. As a matter of claim construction, claim 32 depends from and includes all of the limitations of claim 30. Specifically, claim 30 recites a recombinant DNA construct comprising the polynucleotide of claim 25 operably linked to at least one regulatory sequence. Such a construct does not occur in nature, it requires the intervention of man, i.e., "the hand of man." Claim 32 encompasses the presence of the recombinant DNA construct according to claim 30. Since claim 30 encompasses a recombinant construct that does not occur in nature, then so too does claim 32. Therefore, it follows *a fortiori* that the "hand of man" is indeed present in claim 32. Accordingly, withdrawal of the rejection of claim 32 under 35 U.S.C. § 101 is respectfully requested.

The following remarks are duplicative of remarks made in the Response/Amendment submitted on June 6, 2005, and are presented here for the convenience of the Examiner.

Claims 25-30, 32, and 34 are rejected because the "claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility" (Office Action, page 2). The Office Action states that there is no 'real world' use, and that further

research is required to identify a disease in which the encoded protein is involved. The Office Action further states that identifying a polynucleotide that encodes a sucrose transporter does not convey a specific and substantial utility, citing Bisson 1993 as the state of the art, and further stating that membership in a class of transporters may not impart a utility to a new member because of substrate variability. Applicants respectfully traverse, and request withdrawal of this rejection in view of the following.

First, as now pending, Claims 25-30, 32 and 34 recite, inter alia, a nucleotide sequence encoding a polypeptide having sucrose transport activity. With respect to substrate variability, Applicants note that the claims require SUCROSE transport activity, such that substrate variability is irrelevant. Those members of the class of transporters that do not have sucrose transport activity are outside the scope of the claims. In this respect, the Bisson 1993 reference cited in the Office Action is not appropriate to cite as the state of the art, since it is directed more broadly to sugar transporters, and also is several years older than more recent and more relevant literature references. Furthermore, the discussion in the Office Action of the yeast glucose transporter of Liang et al is even more remote from the subject matter of the instant application. The Office Action applies an improperly broad classification to argue that the instantly claimed invention lacks utility due to its differences from remotely related species.

Sucrose transport genes are thought to encode a protein containing two sets of six membrane spanning regions. See Lemoine (Biochim. Biophys. Acta 1465:246-262 (2000)) (hereinafter "Lemoine"; cited previously in the IDS of October 2003 and considered in the Office Action of April 2004), and in particular Figure 3 of in this reference found on page 255). The green circles represent residues that are conserved in all 12 sucrose transporter sequences found in Table 1 (page 249). The yellow circles correspond to residues conserved in 11 out of

12 sequences. Lemoine notes at page 256 that "amino acid conservation occurs in regions which could be related to transmembrane a-helices, whereas a high variability was found in the N- and C-termini and the central loop. The highest conservation is found is [sic] transmembrane segments 1, 2 and 11." Appendix A, attached hereto, presents an alignment of the maize SEQ ID NO:2 of the pending claims, rice SEQ ID NO:26 of the instant application (NCBI GI 2723471), and a maize sucrose transporter (NCBI GI 5771354) (maize sucrose transporter disclosed in Aoki (Plant Cell Physiol. 40:1072-1078 (1999)) (hereinafter "Aoki"; cited previously in the IDS of October 2004 and considered in the Office Action of February 2005), using the Clustal V alignment method with default parameters. The conserved amino acids among all three sequences can be found in Consensus #1. The four conserved cysteine residues are indicated by boxes. SEQ ID NO:2 has 129 out of 135 conserved residues (green circles shown in Figure 3 of Lemoine) and all four conserved cysteine residues. Attached as Appendix B is a chart setting forth a comparison of the percent identity (and percent divergence in the lower half triangle), using the Clustal alignment method, between the three sucrose transporters found in Appendix A. The maize SEQ ID NO:2 of the pending claims is 81.7% and 91.5% identical, to the rice and maize sucrose transport amino acid sequences, respectively. Applicants submit that one skilled in the art would have no reason to doubt that SEQ ID NO:2 is a polypeptide having sucrose transport activity in view of the foregoing.

Second, Applicants have asserted a utility for polypeptides having sucrose transport activity, for example, for use in controlling the timing and extent of phenomena such as grain fill duration that are important factors in crop yield and quality, as recited on page 1, lines 17-19 of the instant specification. Scofield et al., (Funct. Plant Biol. 29:815-826 (2002), hereinafter, "Scofield", cited in a Supplemental IDS filed simultaneously herewith), show that

antisense suppression of the rice sucrose transporter gene, OsSUT1, leads to impaired grain filling. Applicants note that the rice sucrose transporter gene disclosed in Scofield is identical to SEQ ID NO:26 of the pending application and Appendices filed herewith. Prior to Scofield, Hirose et al., (Plant Cell Physiol. 38:1389-1396 (1997), hereinafter, "Hirose", cited previously in the IDS of July 2001 and considered in the Office Action of April 2003), saw high expression levels of the rice OsSUT1in panicles after heading and postulated it was involved in transport of sucrose into the filling grain (see Hirose, page 1395, left column, 2nd paragraph; and Scofield, page 816, column 1).

In view of the foregoing, Applicants submit that an asserted utility for polypeptides having sucrose transport activity, such as for use in grain filling and improving yield and quality, is a specific, substantial, and credible utility. Therefore, Applicants request withdrawal of the rejection of claims 25-30, 32, and 34 under 35 U.S.C. § 101 for lack of utility.

35 U.S.C. § 112, first paragraph

The Examiner rejects claims 25-30, 32, and 34 for lack of enablement since one skilled in the art would not know how to use the claimed invention in connection with the lack of utility rejection. Applicants respectfully traverse.

Applicants note that the Examiner has not made an enablement rejection with respect to 'how to make' the invention, but only 'how to use' the invention in connection with the lack of utility rejection. Applicants refer to the above remarks with respect to utility, and note that numerous references in the art (i.e., Lemoine, Hirose, Scofield) refer to the importance of sucrose transport activity and its role for example in grain filling. Therefore, Applicants request

withdrawal of the rejection of claims 25-30, 32, and 34 under 35 U.S.C. § 112, first paragraph, for lack of enablement with respect to 'how to use' the claimed invention.

CONCLUSION

Based on the foregoing remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims and allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 2119-4266. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 2119-4266. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: August 5, 2005

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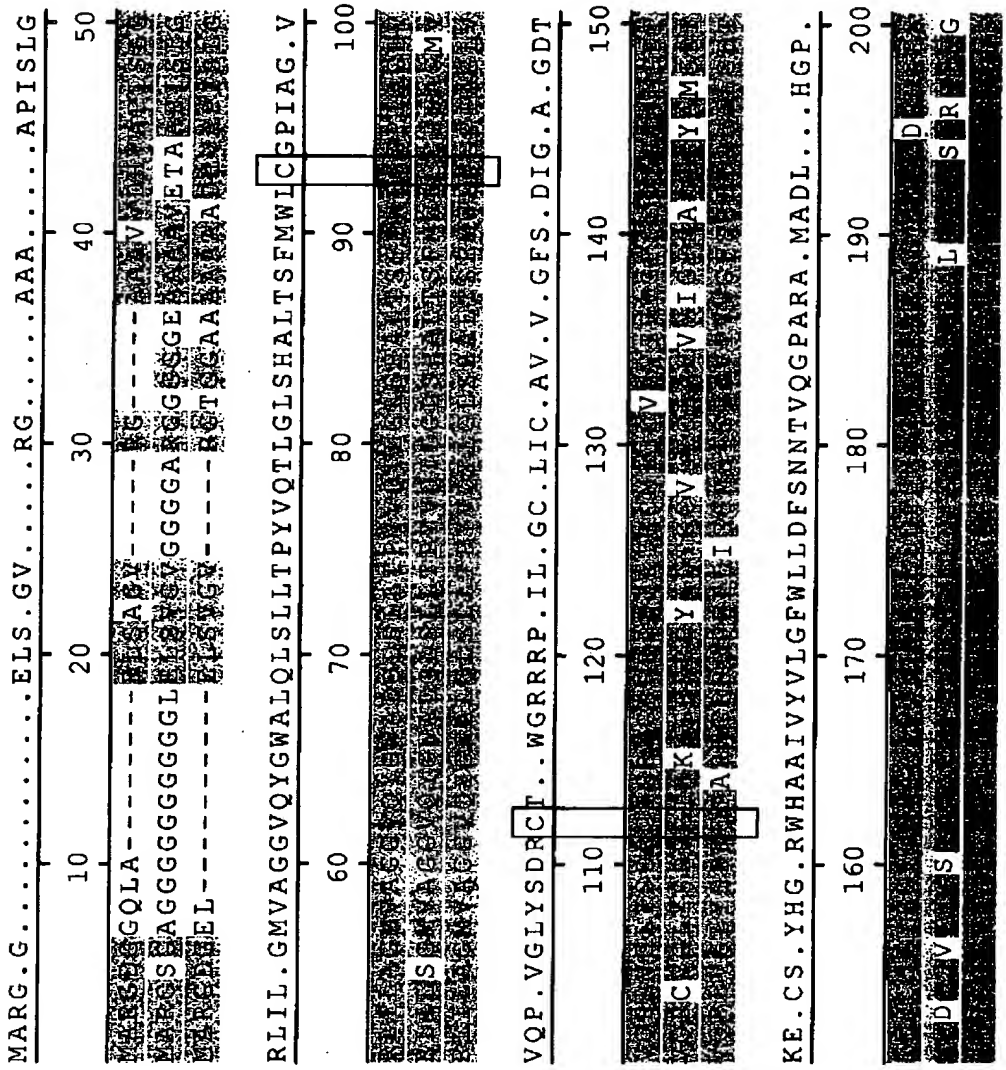
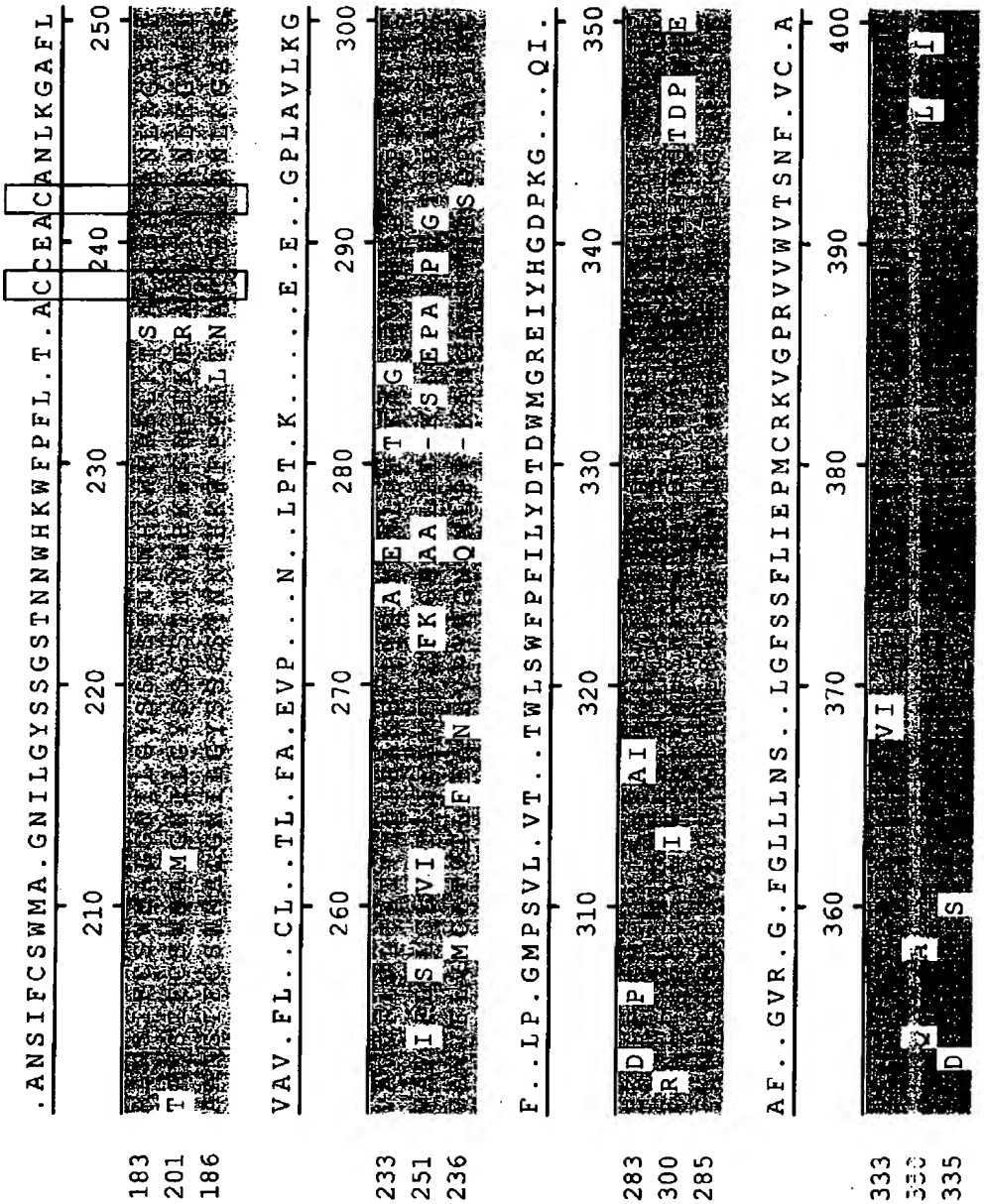
Appendix A (page 1 of 3)



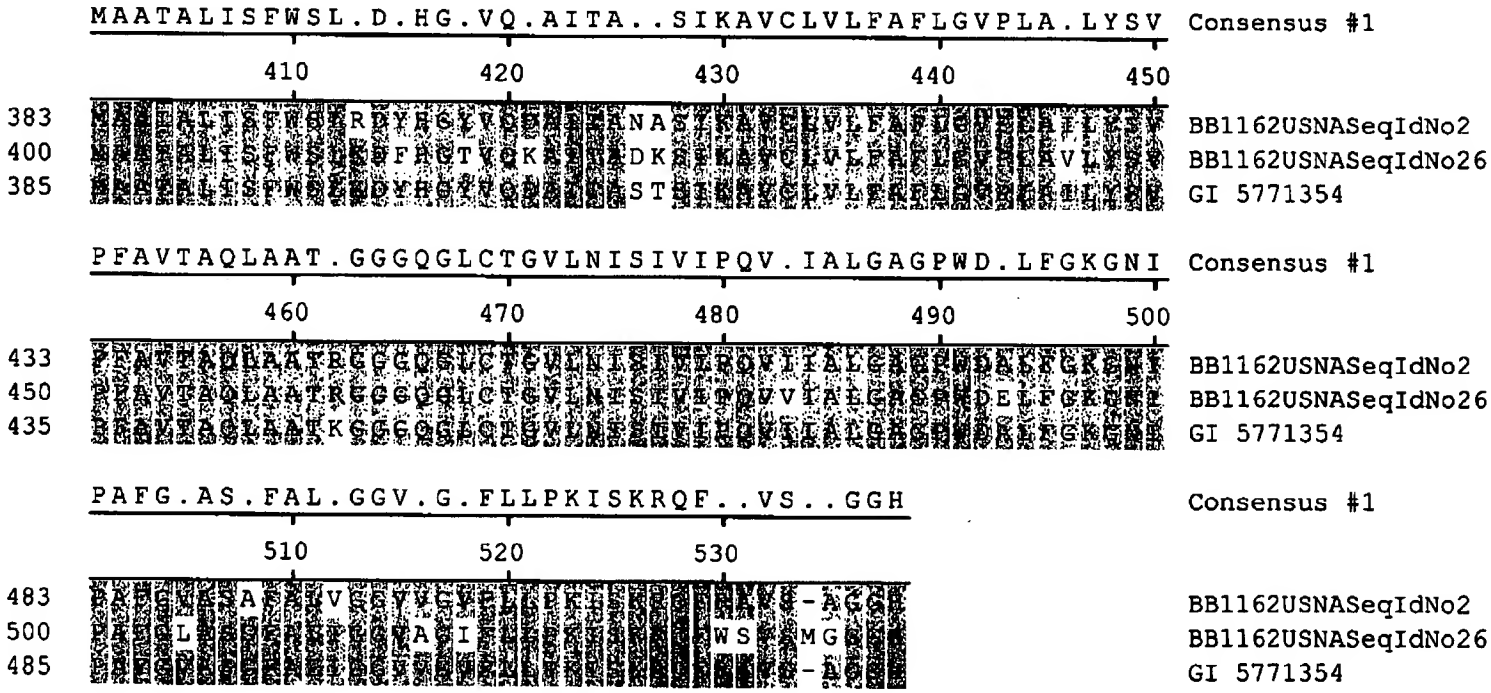
936576 v1

Appendix A (page 2 of 3)



936576 v1

Appendix A (page 3 of 3)



Consensus #1: When all match the residue on the Consensus show the residue of the Consensus, otherwise show '.'

Shade (with black at 40% fill) residues that match the consensus named "Consensus #1" exactly.

Conserved cysteine residues are indicated by boxes.

Appendix B

Percent Identity

Divergence

	1	2	3	
1	[redacted]	81.7	91.5	1
2	17.8	[redacted]	83.7	2
3	6.5	17.0	[redacted]	3
	1	2	3	

Present application: SeqIdNo2 ***Zea mays***

Present application: SeqIdNo26 ***Oryza sativa***

GI 5771354 ***Zea mays***
(from Aoki, Plant Cell Physiol. 40:1072-1078 (1999))

withdrawal of the rejection of claims 25-30, 32, and 34 under 35 U.S.C. § 112, first paragraph, for lack of enablement with respect to 'how to use' the claimed invention.

CONCLUSION

Based on the foregoing remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims and allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 2119-4266. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 2119-4266. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Respectfully submitted,
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Dated: August 5, 2005

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